

A STUDY IN VARIATION IN THE NORTH AMERICAN
GREENBOTTLE FLIES OF THE GENUS LUCILIA,
WITH SYSTEMATIC NOTES ON THE
SPECIES INVOLVED.

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Some few years ago the writer had occasion to make a study in variation of the Canadian species of the genus *Lucilia*. Series of adults were bred, more particularly in the case of *L. sericata* Meig., and from the material thus secured the limits and possibilities of variation in certain directions were determined. The fact was brought out that none of the characters made use of by Mr. C. H. T. Townsend in his "Taxonomy of Muscoidean Flies" for the erection of the ten supposedly new species of the genus contained in that publication are of specific value.

In 1911 an opportunity was afforded of examining the types and cotypes of the above ten species at the U. S. National Museum, in Washington, D. C. The conclusion which had been previously arrived at namely, that the supposed species were only variations of the original four species as recognized by Hough was abundantly justified.

Examinations of the ♂ genitalia were made and these again showed that the conclusion was justified.

It is hoped shortly to publish the results of the study of the ♂ genitalia.

The present paper consists of the results of the study in variation, and of the examination of the U. S. N. M. *Lucilia* material.

A STUDY IN VARIATION IN THE GENUS LUCILIA.

That variation in external morphological characters is a factor to be reckoned with in systematic entomology is today disputed by no working entomologist. At the same time there are comparatively an infinitely small number of the vast array of insects described to date which have had their limits of variation approximated.

That such approximation is possible or practical in all cases cannot be entertained; that it is desirable is beyond question. The single historic example of the tachinid fly *Exorista (Phryxe)*

vulgaris Fall. with its five and one-half pages of synonymy in the "Katalog der Paläarktischen Diptera" is sufficient in itself to establish the desirability of studies in variation.

The present study is concerned with three species of the genus *Lucilia* i. e. *sericata* Meig. *sylvarum* Hough and *caesar* Linn. The method adopted was to breed from isolated egg masses series of adults, examine and record certain selected characters for each fly from each egg mass, tabulate these characters, make synopses of these tables, and finally to draw up from these synopses résumés or extended definitions for each species.

Owing to lack of space only these final résumés appear in this paper. It was the intention of the writer at the outset to keep exact records of at least one hundred examples of each species encountered. This intention was however only realized in the case of *L. sericata* in which case several hundred adults were reared. The number of specimens of each species reared and examined is as follows:

- L. sericata*, Meig., 158 consisting of 57 ♀♀ and 101 ♂♂.
- L. sylvarum*, Hough, 27, consisting of 25 ♀♀ and 2 ♂♂.
- L. caesar*, Linn., 3, consisting of 1 ♀ and 2 ♂♂.

In addition to these bred specimens ten collected specimens of *L. sylvarum* and thirty-one *L. caesar* were also examined, the results being included in the following résumés. This makes the total assemblage of flies for each species: *L. sericata*, 158; *L. sylvarum*, 37; *L. caesar*, 34.

The characters selected for examination were as follows:

- Dorsocentral bristles.
- Posttracostichal bristles.
- Humeral bristles.
- Sternopleural bristles.
- Ocellar bristles.
- Width of front.
- Colour of palpi.
- Colour of first abdominal segment.
- Marginal bristles of second abdominal segment.
- Colour of tegulae.
- Width of apex of first posterior cell compared with the length of the anterior cross-vein.
- Presence or absence of appendage at bend of vein four.

These particular characters were chosen for two reasons (a) to find if possible new taxonomic characters for the separation of the species; (b) on account of the fact that they include all the new characters employed by Mr. C. H. T. Townsend* in the erection of ten supposedly distinct species.

* Taxonomy of Muscoidean Flies. Smithsonian Misc. Col., Vol. 41, No. 1803.

RESUME OF *L. SERICATA*.

In all cases there were three strong pairs of dorsocentral bristles, no rudimentary fourth pair.

In 98.1% of cases there were three pairs of postacrostichal bristles. One of the variations was an extra spasmodically placed bristle of the mesonotum (postsutural). The other variation was that of two postacrostichals only on the left side; this may indicate a past connection between the forms with typically three pairs and those with typically two pairs (*L. caesar*).

As regards humeral bristles 88.7% of the flies examined were supplied with four strong ones on each side. The variations ranged between a form with two on one side and three on the other and the typic form with four on each side. The anterior bristle was always the one to be lost.

The interior bristle seems to have a taxonomic affinity toward the anterior bristle, as in the case of the latter aborting it was usually found that the interior bristle was weak (in one case it was lost completely on one side).

There were in 96.9% of cases 3 sternopleural bristles on each side. This is a generic character and yet there was variation, not in the species as a whole, but in individuals. These variations were in an increase and decrease of these bristles in both number and strength. In all cases the posterior bristles were constant and the anterior alone became modified.

The ocellar bristles varied according to sex.

82.5% of the female flies had two well-defined pairs. In the great majority of these cases the anterior pair was longer and stronger than the posterior pair, but at the same time the latter pair was sufficiently strong to warrant the application of the term 'bristles'. As to position the anterior pair had their insertion within the ocellar triangle and the posterior pair had theirs outside of the triangle and immediately posterior to it. As to the exceptions to this normal condition of two pairs there were a few cases in which the post. pair were weak; one case in which the two pairs were both exceptionally strong; several instances in which there was an extra *bristle* developed on one side within the ocellar triangle and posterior to the normal anterior pair; and finally a few instances in which there was an extra *pair* of bristles developed within the ocellar triangle and post. to the ant. pair.

Of the males 90% had only one pair of ocellar bristles. These were proclinate and had their insertion within the triangle. There was a tendency toward the production of two pairs; in some cases this second pair was hardly stronger than the surrounding hairs; in 7% of cases they had developed into a weak posterior pair; and finally in a solitary instance two distinct pairs were developed.

The width of front affords a secondary sexual character. This character was very constant, there being practically no variation in all the material examined.

In the females the width was one-seventh to one-eighth head width. Hough in his description of this species gives one-sixth to one-eighth head width; this will hold good if that portion near the ocellar triangle is taken into consideration, as at this extremity there is an expansion. In the present study, however, the term width of front is restricted to that portion of the front immediately above the base of the antennae, i. e. the narrowest portion.

In the case of females the width of front was from one-tenth to four-tenths head width.

It may be stated here that measurements of all these flies was not attempted. A small series however of each sex were measured in this particular and with these as a guide the other specimens were visually compared. This may sound somewhat casual, but in reality the method is reasonably accurate as the observer very quickly acquires a due sense of proportion.

The next character lies in the color of the palpi. This character was sometimes very difficult to determine because the palpi were often retracted into the oral cavity. The wall of this cavity varied from an amber yellow color to almost black and the palpi, being semi-transparent, appeared in many cases to be of this dark color and only by removing them could the fallacy be made patent. Again these palpi were covered with fine white hairs and thus in certain planes of vision they appeared white.

The prevailing color of these palpi was amber yellow. This was however by no means constant, there being but 64.4% of the flies with the palpi of this color. The color varied from pale yellow through dark amber yellow to almost black; again in several cases there was an infuscation or dark area at the distal region; and also a black area was occasionally present

at the base. Thus for this species at least the color of the palpi is not constant and the infuscation at the tip has no specific value.

In the color of the first segment of the abdomen was found an excellent secondary sexual character. In all cases it is the dorsal area of the segment that is referred to and not the ventral.

In all males examined the first segment was, at least superiorly, black. In the females this segment varied from the color of the remaining segments (i. e. abdomen unicolorus) to a shade darker; there were few examples of this latter condition.

On the second abdominal segment there was superiorly a row in both males and females, of fairly strong marginal macrochaetae. These macrochaetae were stronger centrally, then became weak and finally became strong again at the sides. These bristles varied slightly, but not to any marked degree; in a few cases they were strong and in a few cases weak; in two instances (1 ♂ and 1 ♀) the two median bristles stood out more prominently thus approaching the condition in *L. sylvarum*.

The tegulae varied from white to brown. This variation was evident in all the series of flies of all species and in one lot of *L. sylvarum* bred from a single egg cluster all intermediate stages were found between the pure white and the brown conditions.

Before passing to the next character it may be well to observe that all flies killed and pinned soon after the time of issuance have pure, or almost pure, white tegulae; and that only in flies that have either been collected, or bred through and left in a cage for ten days or more, have the brown-tinged tegulae been observed. This seems to indicate that the tegulae darken as the fly grows older.

It was found that the width of the apex of the posterior cell in comparison with the length of the anterior cross-vein was slightly or distinctly shorter; the only exception to this was in the case of two flies in which the lengths were equal. This character has not previously been made use of. It is apparently very constant and serves as a separating character for this species from *L. sylvarum*.

The character is best seen when the wing is viewed from below. In vein 4 there was in no case any appendage—even rudimentary—at the angle.

RESUME OF *L. SYLVARUM*.

There were in all cases 3 strong pairs of dorsocentral bristles, but in 33% of the flies resulting from one egg cluster there was a trace of a fourth anterior pair; sometimes this trace exhibited itself as a slightly exaggerated hair on one side only and sometimes it resolved itself into a distinct but weak pair of anterior dorsocentral bristles. There were three pairs of strong postacrostichal bristles in all cases.

As regards humeral bristles there were in most cases four on each side. The majority of variations ran to an abortion of either one bristle on one side only, or of a bristle on both sides. This bristle was always the anterior bristle and, as in *L. sericata*, the loss of it carried with it a weakening of the anterior one. There was in one case a variation in the other direction, namely, the development of an extra bristle, quite strong, on one side only.

Sternopleural bristles were represented by three typical pairs, but, as in *L. sericata*, there was variation, notwithstanding the fact that the character has an undoubted generic value. This variation appeared in 4 specimens and ran in each case to an additional anterior pair, represented either by a bristle on one side only or by a bristle on each side; these bristles were sometimes weak and sometimes strong. In all cases as in *L. sericata*, only the anterior bristles were subject to modification.

Coming to ocellar bristles it was found that, as in *L. sericata*, these afforded secondary sexual characters. The four males had only one strong pair of ocellar bristles. These were proclinate and inserted within the ocellar triangle.

The females had one strong pair inserted within the ocellar triangle and one very weak pair inserted outside the triangle and immediately posterior to it. This weak pair was made up of somewhat exaggerated hairs but the term bristle is perhaps applicable because they stood out from the surrounding hairs (of which there were several pairs). There were in the specimens of this species as in the specimens of *L. caesar* a few hairs within the ocellar triangle. There was variation from the typical condition of one strong pair and one weak in two directions, namely, reduction of the posterior pair and the addition of another posterior pair of these weak bristles or strong hairs.

The width of front affords a secondary sexual character. In the males the front was from one-tenth to one-twelfth head width. Hough gives the width as "very narrow" and "one-eighth to one-tenth head width." A better way is perhaps to say that the width of front in ♂ *L. sylvarum* comes intermediate between that of *L. caesar*, which is linear, and that of *L. sericata* which is from one-seventh to one-eighth head width. Once having examined specimens as to this character in males of all three species it becomes a comparatively easy task to subsequently reduce any male *Lucilia*, on this character alone to its species.

The front of the females was found to be somewhat narrower than in *L. sericata* and about the same as in *L. caesar*. In actual width it was found to be about 3-10 (measurements were made in a number of specimens) of the head width; this is slightly less than 1-3 head width. This character serves very nicely for separating females of this species and of *L. caesar* from females of *L. sericata* which have a front measuring 4-10 head width, or slightly greater than 1-3 head width.

The color of the palpi appears to be far more constant in this species than in *L. sericata*. This color was dark brown or almost black in all but two cases and in these it was black. The color of the dorsum of the first abdominal segment was *not* in this case found to afford a secondary sexual character as in *L. sericata*. In the females the first abdominal segment was either blackish or black, and in the males it was black.

A comparative study of the bristles of the second abdominal segment produced some curious results. In the case of *L. sylvarum* one bred male had a strong pair of median marginal bristles and no differentiated marginal row. 68% of the females in the same lot had a strong central pair of bristles and a weak marginal row; several flies had the central pair no stronger than the remaining bristles of the marginal row. Again in another lot of bred material of 7 females two exhibited this latter condition of having the central pair no stronger than the others.

This variation is important because the presence of a pair of strong median marginal macrochaetae has always been attributed by writers to *L. sylvarum* and here it is shown that the character may vary to quite a considerable extent.

In most cases the central pair were of about the same strength as the remaining bristles. As a rule, however, these

two bristles stood out at right angles, or at least at a considerable angle, to the longitudinal plane of the abdomen; whereas the remaining bristles were barely elevated and extended over the dorsum of the third segment. Thus these central bristles stood out as two distinct macrochaetae. It not infrequently happened however that these central bristles were not elevated and hence they could not be readily distinguished from the others of the marginal row and inference was naturally drawn that they were not present. Their presence could usually be detected by examining the sites of their insertions as compared with those of the remaining bristles; the central pair had their insertions very slightly anterior to the row of marginal macrochaetae.

The tegulae varied, as in *L. sericata*, from white to smoky; in one lot of bred material particularly an excellent gradational series, in respect to this character, was obtained.

The apex of the first posterior cell of the wings was, unlike the condition in *L. sericata* or *L. caesar*, longer than the anterior cross vein. This character is best seen from the under surface of the wing. It is apparently one of the best for separating this species from *L. sericata*. There was often a short spur at the angle of the fourth longitudinal vein.

RESUME OF *L. CAESAR*.

In all cases there were three strong pairs of dorsocentral bristles and there was no rudimentary or vestigial fourth pair.

In all cases but one, two pairs of postacrostichal bristles were found to be present. In this one exception there was an extra pair erratically placed.

The humeral bristles varied considerably. In the bred specimens there were two flies with two pairs and one fly with three pairs. The most common condition was two pairs, but there were a number of specimens with an extra anterior bristle on each side, and again others with a complete anterior fourth pair. At the other extreme there was a fly with two bristles on one side and three on the other. There was thus greater inconstancy of humeral bristles in this species than in either of the other two. It is interesting to note that it was always, as in *L. sericata* and *L. sylvarum*, the anterior bristles and of these the interior pair that were subject to variation.

The sternopleural bristles were represented in all cases but one by the normal three pairs. In this one exception the anterior bristle on one side was reduced to a long hair. It was the anterior bristle that became modified.

The ocellar bristles, as in the other two species, afforded secondary sexual characters.

The males had in all cases the one strong proclinate pair as in *L. sericata* and *L. sylvarum*, having insertion within the ocellar triangle. The females had the usual one strong pair having insertion within the ocellar triangle. The posterior pair were in most cases reduced to hairs, thus being less strong even than in *L. sylvarum*. There was one curious variation in which there were one strong pair and two very weak pairs of bristles; both these weak pairs were posterior to the strong anterior pair; one of them was inserted within and the other outside of the ocellar triangle. There were in addition to the bristles a number of hairs both within and outside of the triangle.

The color of the palpi was, in the specimens of this species examined, very constant. It was without exception amber yellow.

The width of front here again afforded a secondary sexual character. All the males had the front linear; it was considerably narrower than in *L. sylvarum*, and very considerably narrower than in *L. sericata*. In the females the width of front varied from three tenths to one third head width; the more general condition however was about three tenths, or the same as in *L. sylvarum*.

The color of the dorsum of the first abdominal segment varied from that of the remaining segments (abdomen unicolorous) to black. Between these two extremes there were numerous gradational variations; the most common of these was that in which the segment was somewhat darker, especially centrally, than the remaining segments.

As to the color of the tegulae there were found to exist the same variations as in *L. sylvarum* and *L. caesar*. The extremes were white and brown and between these were found numerous combinations. The more common condition was that of 'tinged brown.'

Regarding the last character, namely, the comparison in lengths of the apex of the first posterior cell and anterior cross

vein it was found that this species comes in this respect midway between *sericata* and *sylvarum*. In four cases the apical margin of the first posterior cell was slightly shorter than the length of the anterior cross vein, which is the typical condition in the case of *L. sericata*. In the remaining twenty seven flies it was about equal to the length of the anterior cross vein. Thus for this species the character will not serve to differentiate from the other two species.

Having completed the résumés for the three species of *Lucilia* the opportunity may be taken to make a few general remarks on characters which have not been made use of in the tables.

First, as to size, there was found to be little difference in the three species. Possibly *caesar* is generally somewhat larger than the other two. In each species there is however a considerable variation. To illustrate this it may be said that in over 200 specimens of *sericata* the smallest fly was 5 mm. long and the largest 9 mm.; the average length was from 7 to 8 mm.

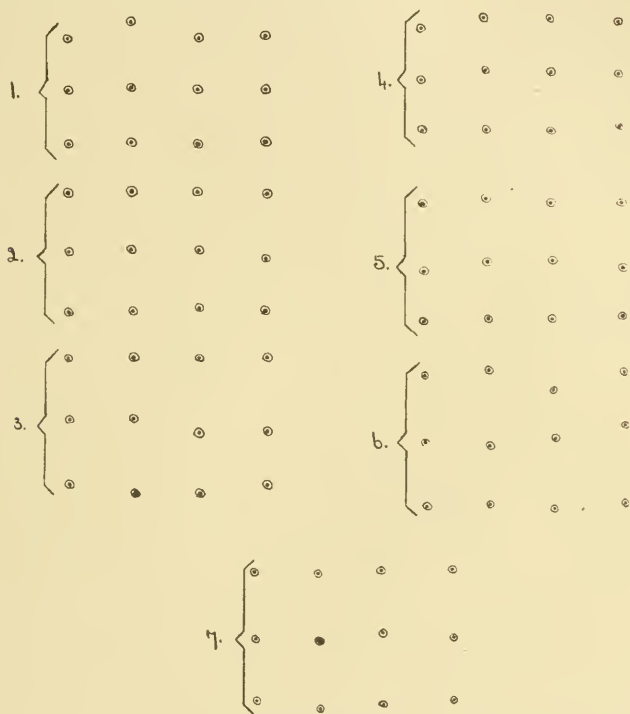
Then as to general color there was again a great range of variation. Hough makes remark* that 'In all the Calliphorineae of metallic color the shade varies through violet, green, blue and copper color.' One has only to look at a long series of *Lucilia* to find that, in this genus at least, the remark holds true. Generally, however, flies of *L. sericata* are brighter, owing to a greater preponderance of the coppery color, then are those of *L. caesar* and *L. sylvarum*.

Lastly a word may be said regarding the positions of the dorsocentral and postacrostichal bristles both in relation to the respective series separately and in relation to one another. As to the positions in their respective series it was found that they were placed, almost without exception, in the same plane longitudinally (cephalad-caudad) although there was variation. Then as to the relative positions of the dorsocentrals and postacrostichals there was found to exist a considerable variation: taking any four bristles transversely an imaginary line drawn through their insertions usually approached a straight line; this line was however scarcely ever absolutely straight and the deviations from it did not follow any definite plan. The

*Synopsis of the Calliphorineae of the U. S., Zool. Bull., Vol. II, No. 6, Sept., 1899, p. 283.

accompanying diagram showing the positions of these thoracic bristles in the case of seven flies all bred from a single parent indicate this variation better than can any description.

The point is of interest on account of the fact that Mr. Townsend (loc. cit. p. 121) in describing a new species of *Lucilia* (*L. giraulti*) makes use of the relative positions of the postacrostichal and dorsocentral bristles.



DIAGRAM

Showing variation in relative position of dorsocentral and postacrostichal bristles in the case of 7 specimens of *L. sericata*, all bred from the same parent fly.

Legend:

Each dot within a circle represents the insertion of a bristle.

Each bracketed group (of the total 7) represents the dorsocentral and postacrostichal bristles of one fly.

The two outside rows of bristles are dorsocentrals.

The two inside rows of bristles are postacrostichals.

The chief value of this study in variation lies in the fact that each species dealt with was found to be subject to considerable variation in the matter of chaetotaxy, color, size, etc. Also in that all the new characters used by Mr. Townsend (loc.

cit.) for the erection of the ten supposedly distinct species are shown to come within the limits of variation of the North American species of *Lucilia* as recognized by Hough.

NOTES ON THE TYPES AND CO-TYPES OF LUCILIA SPECIES IN THE
U. S. NATIONAL MUSEUM.

The following notes were made in 1911, through the courtesy of the U. S. N. Museum authorities, on the types and cotypes of Mr. Townsend's supposedly new species of *Lucilia*. In some cases the Taxonomy of Muscoidean Flies, Smithsonian Misc. Col., Vol. 41, No. 1803, notes refer to the original descriptions. The value of certain characters employed in these descriptions is discussed in the preceding portion of this paper.

Lucilia morilli. Town.

The type specimen together with all the co-types are *Pseudopyrellia cornicina* Fab. There are no hypopleural bristles and the fourth vein is curved and not angular.

Lucilia nigripalpis. Town.

The type specimen must be referred to *L. sylvarum* Meig. The width of front is slightly less than one-third head width; the palpi are blackish; the first segment of the abdomen is blackish; on the second segment of the abdomen there is a well marked pair of median marginal macrochaetae quite as strong as are found in most specimens of *L. sylvarum*. The abdomen is however 'dented' in consequence of which the macrochaetae are appressed against it and this is presumably the reason that they were overlooked by the author of the species; there is a weak pair of extra ocellar bristles just posterior to the ocellar triangle and quite typical of *sylvarum*; in the comparative lengths of the apex of the first posterior cell and the anterior cross vein the fly is typically *sylvarum*.

The co-type is an undeveloped specimen of *L. sylvarum* Meig; the head characters are all typical except in the color of the palpi which are distinctly brownish, especially toward the base; the lower side however of the abdomen and also the legs both show this light color which means that the fly was captured soon after issuing; toward the tip the palpi become blackish and this is carried down one fourth distance to base; as to marginal macrochaetae on the abdomen there is a weak pair on the second segment which show up better when the fly is examined from the dorsal side; when the specimen is viewed laterally there is seen to be one other bristle near the center of the same segment; it is about as long as the shorter of the central pair but the base is weaker.

Lucilia angustifrons. Town.

The type specimen is a ♂ from England and the single co-type is a ♀ from Kaslo, B. C., which "seems to be this form" (Townsend, Taxonomy of Muscoidean Flies, p. 120). An examination of the type shows that a third and anterior pair of postacrostichal bristles is present; at the same time both these bristles are weaker than those situated posterior to them in the same rows and moreover the bristle on one side is decidedly less strong than that on the other side (the one on left side is weaker). This is the only character that separates the fly from typical *L. caesar* and as in this very character there is an irregularity it seems highly probable that the pair of bristles is nothing but a sport in which case the form must be referred to *L. caesar* Linn.

As to the single co-type, the ♀ from Kaslo, this fly has two postacrostichal bristles on one side and three on the other with the anterior one weak; the fly is unquestionably *L. caesar* Linn.

Lucilia giraulti. Town.

One ♂ from Paris, Texas, no cotypes. In the original description of this species (Townsend, Taxonomy of Muscoidean Flies, p. 121) there is only one character mentioned that would separate the form from *L. sericata* Meig. which is that "a second pair of ocellar bristles is present." Even were this so the character would be insufficient in itself as the study of variation for *L. sericata*, brought out the fact that in this species there is occasionally developed a second pair of ocellar bristles. An examination of the specimen itself however shows that the bristles in question are *not* developed. The fly is therefore *L. sericata* Meig.

Another character used in the description of this species is the position of the postacrostichal bristles relative to the dorsocentrals. The study in variation brought out the fact that this character has no determinative value. The above specimen is badly mutilated.

Lucilia barberi. Town.

A discussion of this supposed species is hardly necessary. All the characters employed to separate the form are met with

in *L. sericata* Meig. An examination of the type specimen and also of four cotypes shows that the form may be referred to *L. sericata* Meig.

Lucilia unicolor.

Five ♀ specimens from New Mexico, Mexico and British Columbia. They are all *L. caesar* Linn. The second pair of ocellar bristles is fairly strong in the type specimen, but in the co-types there is variation and they become less strong, in any case all come within the limits of variation of *L. caesar*.

Lucilia purpurea. Town.

There is no character in the description of this form which serves to separate it from *L. caesar* Linn. In the description it is stated that "the whole body is purplish, strongly violet tinged, especially in the ♀." This is certainly somewhat of an unusual hue for *caesar*, but a series can be arranged from the U. S. N. Museum material showing all gradations from this form to almost pure green. An examination of the type and co-type shows that there are no structural characters separating the form from *L. caesar* and the name *purpurea* Town. must therefore sink.

Lucilia australis. Town.

Two ♀ ♀ from the southern states and one ♂ from Alaska. The type and one co-type, both from the southern states, must be referred to *L. pilatei*. Hough. The ♂ from Alaska agrees with *L. caesar* Linn. in everything except the width of front which appears to be very slightly greater than in *L. caesar*. This, however, is probably partly optical, as the inner margins of the eyes, in the region of the ocellar triangle, are blackish, and thus appear to be part of the front.

Lucilia infuscata. Town.

From the description (Townsend. Taxonomy of Muscoidean Flies, p. 123) it is evident that the ♂ ♂ are *L. caesar* Linn. as all the characters enumerated come within the limits of variation of that species.

The ♀ ♀ of which there are six, "can be told from *caesar* only by the narrower front and darker basal segment." As to the latter of these characters the study in variation for *L. caesar* brought out the fact that in that species the first segment

of the abdomen is not unicolorous with the other segments, but darker. As to the former character, i. e., the 'narrower front,' the more general condition met with in *caesar* as to width of front is less than one third head width, or to be more specific three tenths head width; *infuscata* is described as having the front two-sevenths head width and the difference between three-tenths and two-sevenths is one-seventieth, which reduces the character as a differentiating one to an absurdity.

An examination of the type and co-type bears out the above remarks and proves the form to be *L. caesar* Linn. with the exception of one co-type which is *Phormia regina* Meig.

Lucilia oculata. Town.

Six ♂♂ and two ♀♀. The former are *L. caesar* Linn. and the latter are *L. pilatei* Hough. The author of *oculata* lays stress on the color of the face and antennae, which are described in this instance as brownish yellow instead of black. After examining the U. S. N. Museum *caesar* material the writer found that taking three specimens from England, one from Mexico and one from Connecticut an excellent gradational series could be made, showing transition from black to light reddish brown. In this connection it may be stated that the late Mr. D. W. Coquillett collected a specimen of *L. pilatei* Hough, in Washington, D. C., which exhibits some remarkable colorational features. The whole fly is quite light, especially the legs and venter, but it is distinctly 'shot' with green and blue, so that in different lights it takes on different colors; the parafacials are pale reddish yellow. It is the experience of the writer that, within certain limits, the earlier a specimen of *Lucilia* is captured after issuance the lighter will be the color.

The synonymy indicated in the above notes on the types and co-types of *Lucilia* species in the U. S. N. Museum may be listed as follows;

- Lucilia morilli*, Town = *Pseudopyrillia cornicina*, Fab.
- Lucilia nigripalpis* Town = *Lucilia sylvarum*, Meig.
- Lucilia angustifrons* Town = *Lucilia caesar*, Linn. (abnormal fly).
- Lucilia giraulti* Town = *Lucilia sericata* Meig.
- Lucilia barberi* Town = *Lucilia sericata* Meig.
- Lucilia unicolor* Town = *Lucilia caesar* Linn.
- Lucilia purpurea* Town = *Lucilia caesar* Linn.
- Lucilia australis* Town = *Lucilia caesar* Linn.
- Lucilia infuscata* Town = *Lucilia caesar* Linn.
- Lucilia infuscata* Town = (1 cotype) = *Phormia regina* Meig.
- Lucilia oculata* Town, male = *Lucilia caesar* Linn.
- Lucilia oculata* Town, female = *Lucilia pilatei*, Hough.

It may be stated that Mr. W. R. Thompson and the late Mr. D. W. Coquillett examined independently the above material and both gentlemen substantially confirmed the above synonymy. Before leaving the subject of synonymy the opportunity may be taken of making a few remarks on some species listed in Aldrich's catalogue of North American Diptera. As regards *Lucilia sylphida*, Bigot. a copy of the original description (Ann. Soc. Ent. de France 1877, p. 45.) which was furnished the writer through the courtesy of Prof. J. M. Aldrich, is as follows:

"17. *S. Sylphida* female (nov. sp?).

Viridi metallico. (Abdomen?) Antenn. segmento 3.0 secundo quadruplo longiore. Alis, vena 4a usque ad apicem primæ spinosa. Cicatrice subhumerali nigra. Facie, basi tantum, duobus macrochaetis munita. Antennis palpisque pallide testaceis. Fronte grisea, occipite utrinque, obscure ænescente, vitta nigra apice fulva, facie albida, genis pallidissime testaceis; calypttris albis; alis hyalinis basi, pallidissime testaceus; pedibus, fusco-nigra, femoribus, extrinsecus, parum æneis. (L'abdomen manquant, est ce bien une espece nouvelle?)"

In this brief description mention is made of none but generic characters and these in a most general way. The form is probably not a distinct species, but this can only be ascertained by an examination of the type. As to some of the other species:

Lucilia mollis, Walk.

Hough refers doubtfully to *Phormia regina*.

Lucilia rufipalpis, Jaen.

Hough refers to *Phormia regina*.

Lucilia nobilis, Meig.

Mr. Austen, of the British Museum writes that this form is now generally considered to be synonymous with *L. sericata*.

Lucilia sylphida, Big.

Probably not a distinct form.

Lucilia terræ-novæ, Des.

Hough refers to *Phormia*.